



ExCam[®] vario

User manual

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Revision history

Product: ExCam[®] vario
 Title: User Manual for the ExCam[®] vario
 Doc. -Id. 131012-PT03BA-RT-ExCam vario_en_rev.02
 Author: Roger Thoms
 Date: October 12, 2013

Rev.- Index	Date	Name	Comments	Authorization of the ATEX Supervisor
00	Oct 12, 201	R. Thoms	Compilation of the document	 Tested and approved Oct 31, 2013 – S. Seibert
01	Nov 1, 2013	S. Seibert	Revision and correction	 Tested and approved Nov 1, 2013 – S. Seibert
02	March 28, 2014	T. Gruber	Standardization of chapters	 Tested and approved Apr 07, 2014 – S. Seibert

1 Document Overview

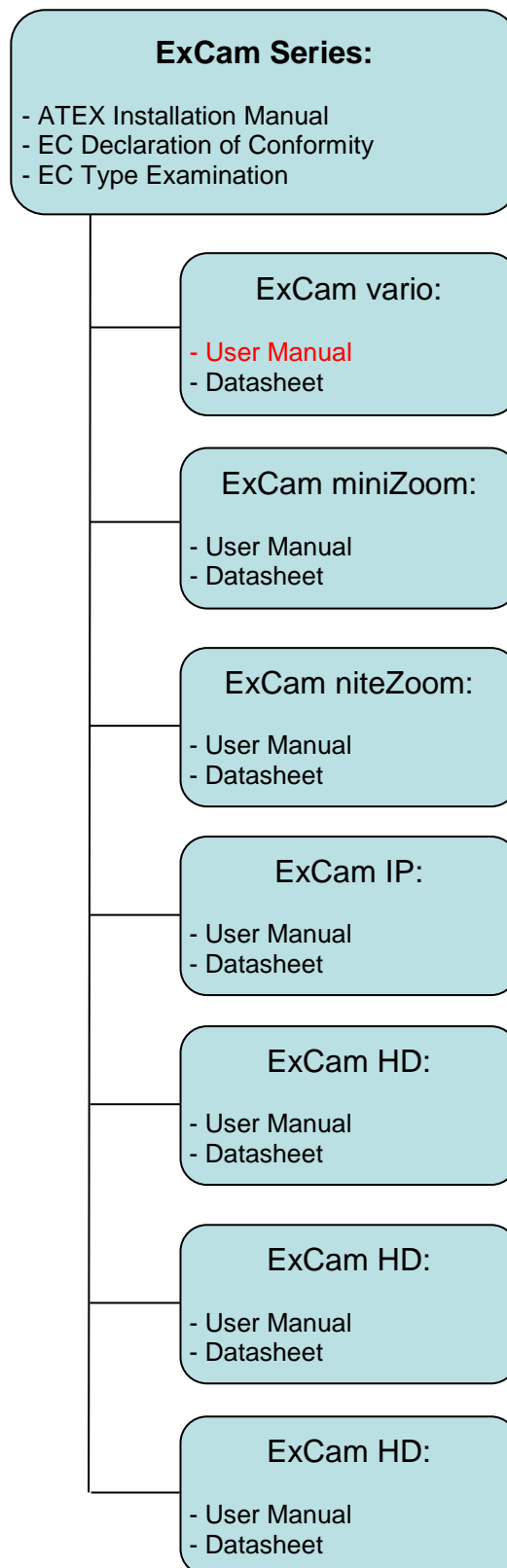




Figure 1.1 Document overview

The present document is marked in red.

2 Technical Data

2.1 Parameters of the explosion protection

Identification marks according to
 Directive 94/9/EG:

 II 2G (zone 1 and 2)
 II 2D (zone 21 and 22)

Explosion protection (gas):

Ex d IIC T6 Gb or
 Ex d IIB T6 Gb

Explosion protection (dust):

Ex t IIIC T80°C Db IP67

EC-type examination:

TÜV 09 ATEX 7697 X

Inspection record:

194/Ex.697.00/09

2.2 Electrical parameters

Supply voltage:

+12 V DC to +30 V DC

Maximum power input:

5.5 W

Power input:

approx. 460 mA @12 V DC
 approx. 230 mA @24 V DC

2.3 System cable SKAxx

Outer diameter:

9.4 mm

Bending radius:

min. 150 mm

Video:

1x75 Ω Koax, 19x0.127mm tinned AWG 24,
 plated copper braid, shielded

Power supply camera:

2 x 0.75 mm²

2.4 Sensor

Sensor:

1/3" CCD Sony Super HAD Interline Transfer

Effective sensor resolution:

PAL: 440,000 Pixel (approx. 752 x 582)

Horizontal resolution:

PAL: 540 TV lines

2.5 Lens

Lens:	Varifocal
Focal (f):	3.8 mm to 9.5 mm
Angle of view:	74.2° (wide) to 30° (tele)
Iris:	F1.2 to F2.0
Minimal illumination:	0.15 lux
Recommended illumination:	0.5 lux to 100,000 lux
Minimum object distance:	150 mm

2.6 Electronic functions

- DC iris control
- Automatic Shutter Control (ESC)
- Digital signal processing (DSP)
- Back Light Compensation (BLC)
- Auto White Balance (ATW)
- Removable IR-cut filter (ICR)
- Automatic gain control (AGC)
- Composite video (VBS) video output 1 Vpp
- SNR: 48 dB

2.7 Other technical data

Permissible ambient temperature:	-20 C° - 50 C° (depending on camera module)
Protection level EN 60529/IEC 529:	IP 67
Housing material:	Aluminum die cast or V2A Stainless steel 1.4301 (standard) or V4A Stainless steel 1.4401 (customized) V4A Stainless steel 1.4404 (customized)
Glass material:	Borosilicate glass
Weight:	2100 g (stainless steel T03-VA) 1900 g (Aluminum housing T03-AL)
Dimensions (L x D _{max}):	128 mm x 77 mm (stainless steel housing T03-VA without cable gland) 163mm x 98 mm (Aluminum housing T03-AL without cable gland)
Fitting of the flame proof gap preventing the transmission of ignition (cylinder) T03-VA...:	Diameter: 57 mm H8 f7

3 Safety guidelines

Please observe the safety guidelines indicated in the ATEX installation manual of the ExCam series!

4 Illustration of the model key

The following model options are currently available for the ExCam vario:

Product name	Model option					
	ATEX Type	housing option ⁽¹⁾	Explosion group ⁽²⁾	Meter SKA02 ⁽³⁾	Cable termin. ⁽⁴⁾	Temp. range ⁽⁵⁾
ExCam vario	T03-	VA-	B-	005-	K-	L
	T03-	VA-	B-	005-	P-	L
	T03-	VA-	C-	005-	K-	L
	T03-	VA-	C-	005-	P-	L
	T03-	AL-	B-	005-	K-	L
	T03-	AL-	B-	005-	P-	L
	T03-	AL-	C-	005-	K-	L
	T03-	AL-	C-	005-	P-	L

**all model options are available in stainless steel and aluminum housing with K1 or K2 supply flange (q.v. chapter 10 – technical drawings)*

- (1) VA = Execution in stainless steel
AL = Execution in aluminum die cast
- (2) B = Explosion group II B (standard - all gases except hydrogen, acetylene, carbon disulphide)
C = E Explosion group II C (all gases)
- (3) Length of the connection line in meter (001 - 200)
(5 meter is the standard length)
- (4) K = Terminal block connection (standard)
All signaling lines are spliced to single strands and furnished with wire-end ferrules to allow connecting the camera to a terminal block
P = Plug- termination
Approximately 30cm of the system cable's outer stealth is stripped.
The power supply strands (RD, BK) are furnished with wire-end ferrules.
The AWG24 cable is furnished with a BNC connector
- (5) L = Low temperature (-20° C to 50° C)

5 Commissioning



Attention!

Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14) as well as the safety guidelines described in this user manual and the ATEX installation manual!



Attention!

Please observe the installation and commissioning advices described in the ATEX installation manual!

5.1 Step 1: Installation

Install the ExCam[®] vario at the desired location.

Mounting options, accessories, as well as safety guidelines are described in the ATEX installation manual of the ExCam[®] Series.



Attention!

Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14) as well as the safety guidelines described in this user manual and the ATEX installation manual!



Attention!

Please observe the installation and commissioning advices described in the ATEX installation manual!



Warning!

When the iris is open, the camera must not be directed toward the sun as this can cause damages to the sensor.

5.2 Step 2: Electrical connection



Attention!

The electrical connection of the equipment must be executed by qualified personnel only!



Attention!

It is mandatory that the housing of the ExCam[®] Series has to be grounded via a PE-connection!



Attention!

The minimum cable length of the connection line must not be less than one meter! The connection cable has to be laid in a protected manner!



Attention!

Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14), as well as the safety guidelines described in this user manual and the ATEX installation manual!

The ExCam[®] vario is delivered with an electrical connection cable type SKAxx (System Kabel Analog). The maximum cable length is 200 m and can be determined individually to reflect the particular customer specifications. The minimum cable length is 1 meter.

The ExCam[®] vario is manufactured with a pigtail reflecting the desired cable length. Any electrical work inside the camera's flameproof enclosure, done by the user, is prohibited. Depending on the model option, the ending of the camera's cable connection is either stripped and furnished with wire-end ferrules or furnished with a BNC connector.

5.2.1 Potential equalization



Figure 5.1 Potential equalization T03-VA and T03-AL

Depending on the housing execution, the equipment's potential equalization is to be carried out at the place indicated in above figure. The profile of the potential equalization has to reflect the national grounding instructions (min. 4mm²).

Connection table:

Potential:	Color (IEC 60757)	Profile	Comment
PA	GN/YE	4 mm ² (fixed)	

5.2.2 Power supply & protection

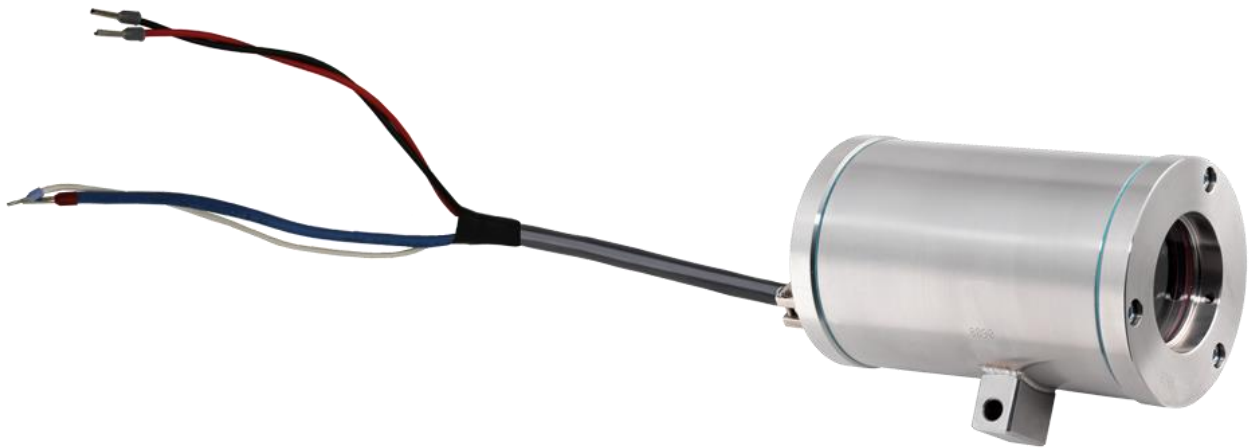


Figure 5.2 ExCam vario – T03-VA-B-XXX-K-L



Figure 5.3 ExCam vario – T03-VA-B-XXX-P-L

The power supply is to be carried out via the red (RD) as well as black (BK) strand.

Connection table:

Potential	Color (IEC 60757)	Potential level	Profile	Comments
L+	RD	+12VDC – +30VDC	0.75 mm ²	
L-	BK	0VDC	0.75 mm ²	

The camera's maximum power consumption is 5.5 Watt.

The dimensioning of the equipment or the supply protection depends on:

- The selected power supply
- The cable length
- The national regulations

The following safety recommendations may serve as a basis:

Supplied power	Length of system cable	Recommended protection	Comments
12 V DC	< 100 m	mT1000 mA	In case the camera is supposed to be operated with 12VDC via a cable length of more than 100 meter, please make sure to use an adjustable switch-mode power supply in order to correct potential drops at the lines
24 V DC	100 m < L < 200 m	mT500 mA	

The release current of the protection has to be less than the maximum short-circuit current of the power supply (switch-mode power supply)!

5.2.3 Video picture connection (CVBS)

Depending on the model key, the video signal of the ExCam[®] is either provided with wire-end (K option) or with a BNC connector (P option). The CVBS signal is only to be connected with the monitor, the video matrix or the video server.

Connection table (T03-VA-B-XXX-K-L)

Potential:	Color (IEC 60757)	Potential level	Profile	Comments
CVBS	WH (BU)	1 Vpp	0.25 mm ²	
CVBS_GND	BU	0 V	2.5 mm ²	

Connection table (T03-VA-B-XXX-P-L)

Potential	BNC - Connector	Potential level	Profile	Comments
FBAS	Center	1 Vpp		No single profile due to BNC connector
FBAS_GND	Ground	0 V		No single profile due to BNC connector

5.2.4 Tests prior to switching on voltage



Attention!

Prior to commissioning, all tests as indicated by the national regulations have to be executed. In addition, it is mandatory that the proper functioning of the operating device in accordance with this user manual and all other applicable regulation has been executed.



Attention!

Incorrect installation and operation of the camera may lead to a loss of warranty!

5.3 Step 3: Adjusting the picture

This step is only necessary in case the picture's default settings (angle, focus, iris or backlight settings) do not deliver a suitable picture quality.



Figure 5.4 ExCam[®] vario – Lens and sensor

Lens data:

Lens type	Varifocal
Lens	F1,2 / F2,0~360 / 3.8~9.5 mm with galvanometer controlled aperture
Aspheric technology	Yes
Focal distance	3.8 mm - 9.5 mm
Horizontally angle of view	74.2° - 30°
Iris Control	DC
MOD (Min. Object Distance)	0.15 m



Information!

If not determined differently, the default setting for the ExCam[®] vario is set to wide angle. With a distance of about 10 meter an object is then focused.

If desired, we customize the ExCam[®] vario's settings to reflect specific requirements. In such a case please advise us at order placement on the requested angle and the object distance.

5.3.1 Work preparation



Attention!

Please carry out any preoperational work carefully and in accordance with the applicable regulations.



Attention:

Note: Depending on the zone classification, it might be necessary to obtain a work permit/clearance! When adjusting the camera settings potentially explosive atmosphere must be avoided by any means!

Please consider that in order to carry out the applicable settings, a feedback regarding the picture quality is required. Please use appropriate devices (laptop, CCTV tester, walkie-talkie to the control room)

- Use appropriate tools
- Make sure you have a secure foothold
- Avoid static charge

5.3.2 Opening the pressure-resistant housing

In case it is necessary to adjust the picture, the pressure-resistant housing has to be opened and after completion of the work securely tightened again. Please be very careful and follow thoroughly the steps of this manual.



„WARNING – DO NOT OPEN IN HAZARDOUS AREA“

Note: Depending on the zone classification, it might be necessary to obtain a work permit/clearance! When adjusting the camera settings, potentially explosive atmosphere must be avoided by any means!

Stainless steel housing (VA)

Loosen the three screws on the flange of the stainless steel housing. Avoid skin or clothing contact with the screw threads which disposes of LOCTITE (chemical basis: Dimethacrylatester) to secure the screws. It is not allowed to open the sight glass flange.

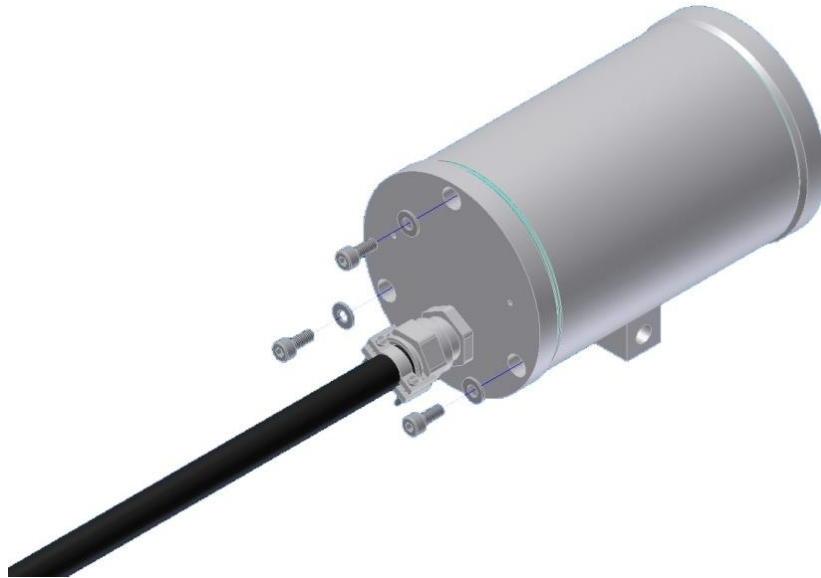


Figure 5.5 Opening of the stainless steel housing (1)

Carefully pull out the lead flange in a straight manner, ensuring that the board module does not tilt. Neither the flange nor the housing must be damaged at the flame proof gap preventing the transmission of ignition. Beware also of tilting. Avoid skin and clothing contact with the cylindrical fit, the surface is treated with lubrication paste (oleaginous).

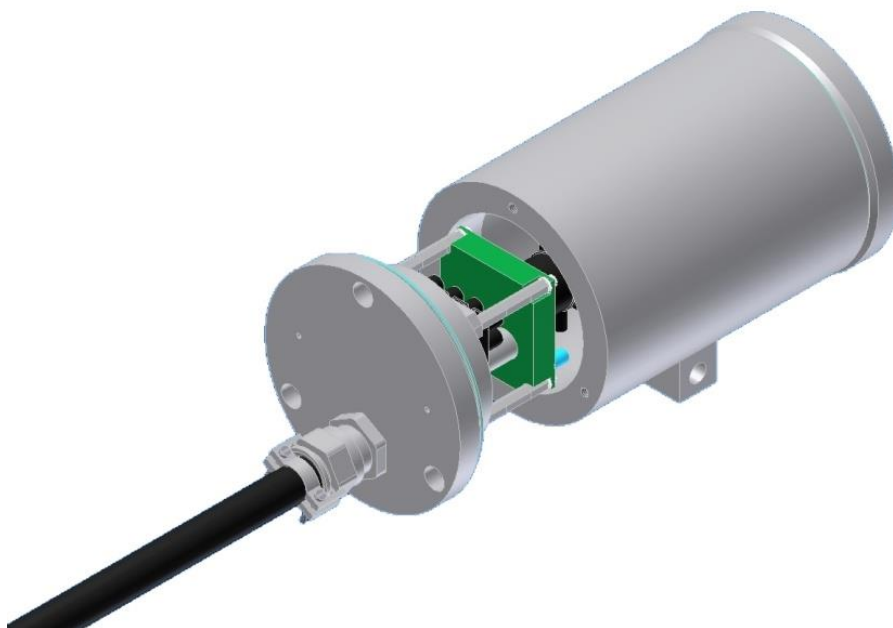


Figure 5.6 Opening of the stainless steel housing (2)

Aluminum die cast housing (AL)

Loosen the three screws at the lock ring (glass flange) of the aluminum die cast housing and carefully take it off.

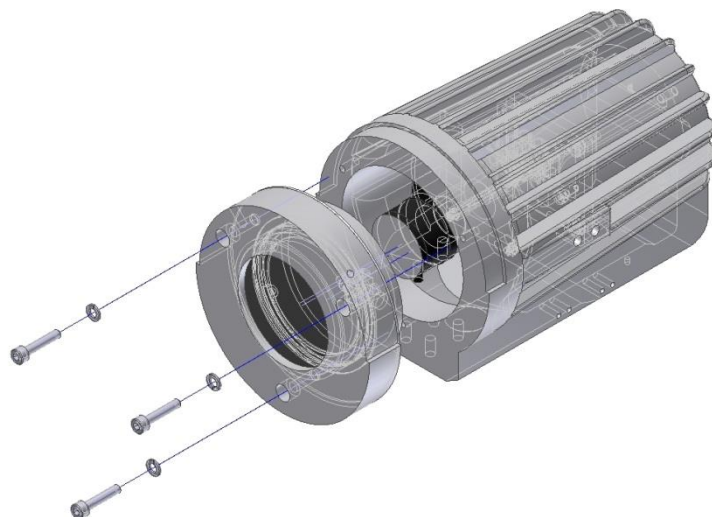


Figure 5.7 Opening of the AL housing



ATTENTION:
 Please make sure not to damage housing sealings

5.3.3 Adjusting the angle (focal distance)

Loosen the knurled screws of the focal distance adjustment (zoom adjustment knob (2)) (q.v. picture below). Adjust the angle by moving the zoom adjustment knob (2) to the left or to the right until the desired focus is reached. Afterwards tightly secure the knurled screws again.



When touching electrical components, potential equalization (grounding of the body) has to be observed (carry a PE wristband etc.)!

5.3.4 Adjusting the focus

Loosen the knurled screws of the focal lens (focus adjustment knob (1)) (q.v. picture below). Adjust the focus of the picture by moving the focus adjustment knob (1) to the left or to the right. Afterwards tightly secure the knurled screws again.

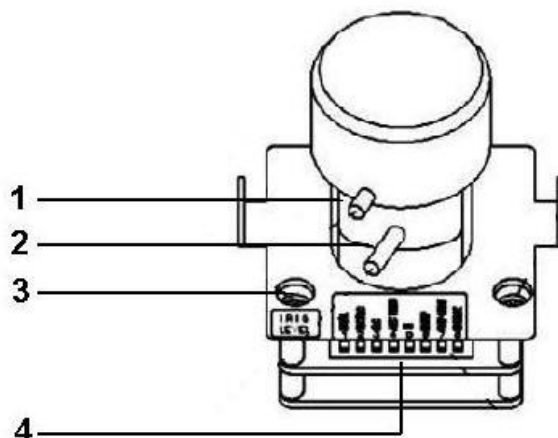


Figure 5.8 Adjustment possibilities of the ExCam vario

1. Focus adjustment knob
2. Zoom adjustment knob
3. Iris level setting-potentiometer
4. Assignment of functional switches

Nr.	Function	ON	OF
1.	Int / Line-Lock	Internal synchronization	Grid connected synchronization
2.	ELC / ALC	Electronic shutter	Auto-Iris
3.	Back light compensation	BLC ON	BLC OFF
4.	Automatic gain control	AGC Turbo	Normal AGC gain
5.	Flicker free	Flicker free ON	Flicker free OFF
6.	Sharpness setting	Sharp	Normal
7.	Day/Night	Activated	Deactivated
8.	Iteration reduction	Activated	Deactivated

5.3.5 Adjusting the iris level setting-potentiometer



Note!

This step is only required in case that the camera shows a crossfaded or, despite sufficient illumination, signal noising picture.

Adjust the iris level setting-potentiometer (3) in such a manner that the best possible video level is achieved (ELC/ALC switches has to be set on ALC).

5.3.6 Further picture optimization possibilities

It is possible to achieve the optimum picture quality by appropriately adjusting the eight functional switches (4).

5.3.7 Closing of the pressure-resistant housing

For closing the housing please, follow, in reversed order, the steps described in chapter 5.3.2 (opening the pressure-resistant housing).

Particularly concerning the flameproof joint (gap), please work very carefully.



ATTENTION:

In case of any mechanical damages that happened to the flameproof joint, the housing must not be used anymore!

Do not lock-in any foreign objects in the housing.

Please make sure that the disassembled screw locks (washer spring DIN7980) are reassembled.

If, when closing the housing, it is noted that the surface of the flameproof joint is dirty or not lubricated sufficiently, please clean it with a clean cloth and suitable cleaning detergent. Afterwards, re-lubricate it with a suitable lubrication agent.

Tighten the M4 flange screws with approx. 3 Nm at a non-lubricated thread. Please avoid extensive tightening – this might lead to a torn screw.

6 Maintenance / Servicing / Alterations

The national regulations concerning the maintenance and servicing of electrical devices within hazardous areas are to be observed.

The required maintenance intervals are specific to the individual devices. The operating company has to determine these intervals depending on the application parameters. During maintenance, focus has to be put on checking parts concerning the ignition protection category such as the integrity of the housing, the sealings and the cable glands. If maintenance measures are necessary they have to be initiated and/or executed.

7 Repairs and Maintenance

Repairs must only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged pressure-resistant housings have to be replaced completely. If in doubt, return the applicable part to SAMCON Prozessleittechnik GmbH.

Repairs concerning the explosion protection must only be carried out by SAMCON Prozessleittechnik GmbH or a qualified electrical technician authorised by SAMCON Prozessleittechnik GmbH in accordance with nationally applied regulations. Rebuilding of or alterations to the devices are not permitted.

8 Disposal / Recycling

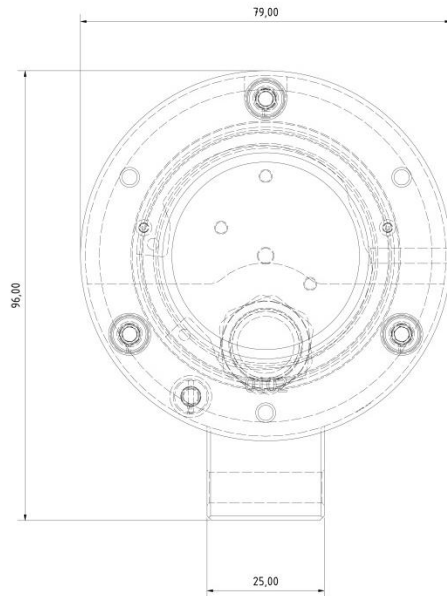
When disposing of the device, nationally applicable regulations must be observed.

This document is subject to alterations and additions.

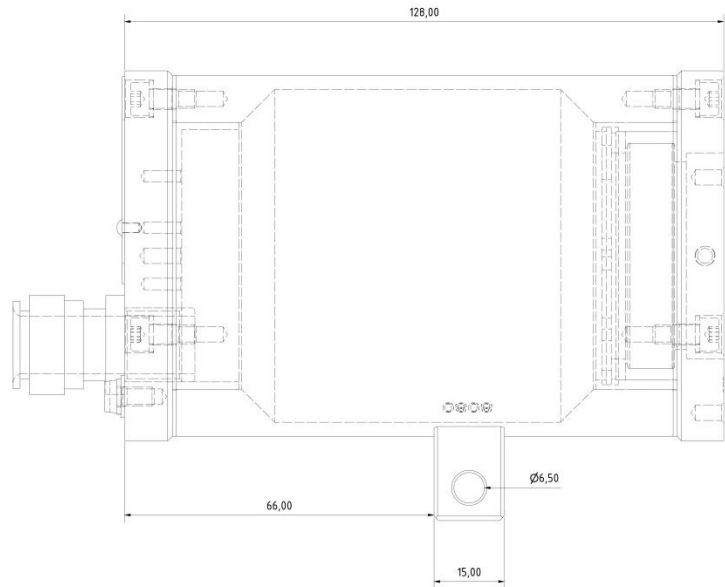
9 Drawings

T03-VA-XX (K1)

Front view

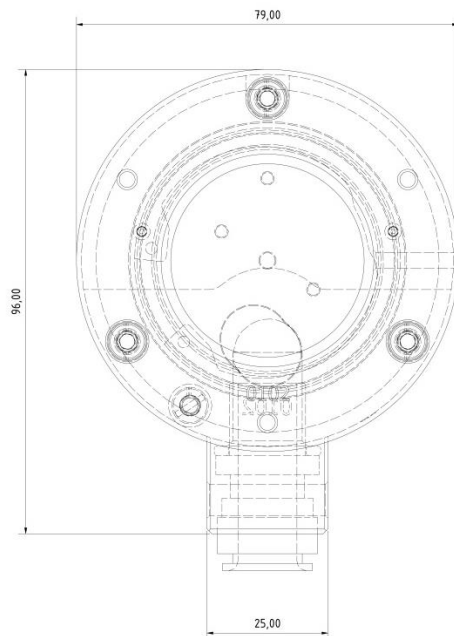


Side view from left

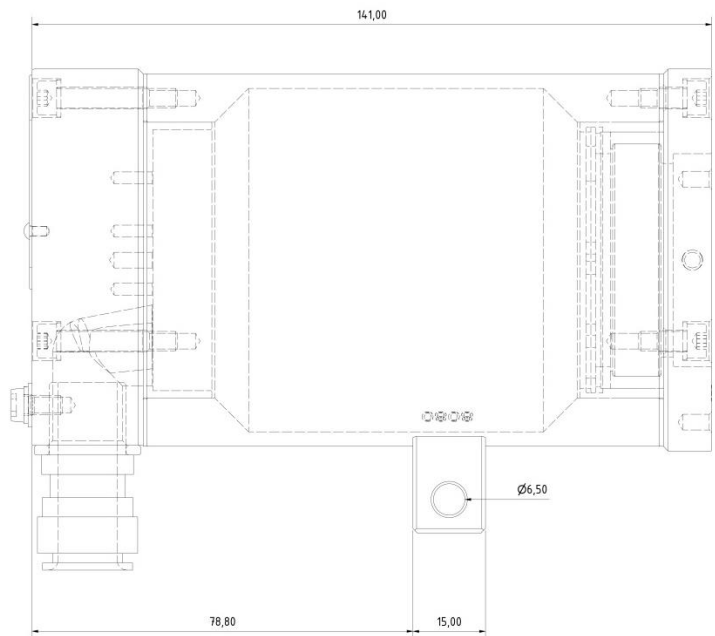


T03-VA-XX (K1)

Front view

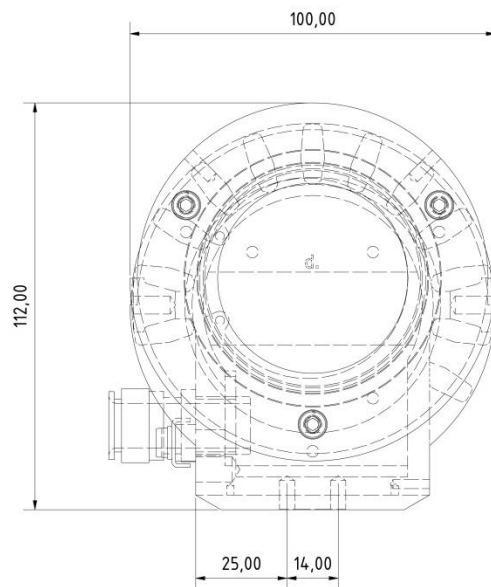


Side view from left

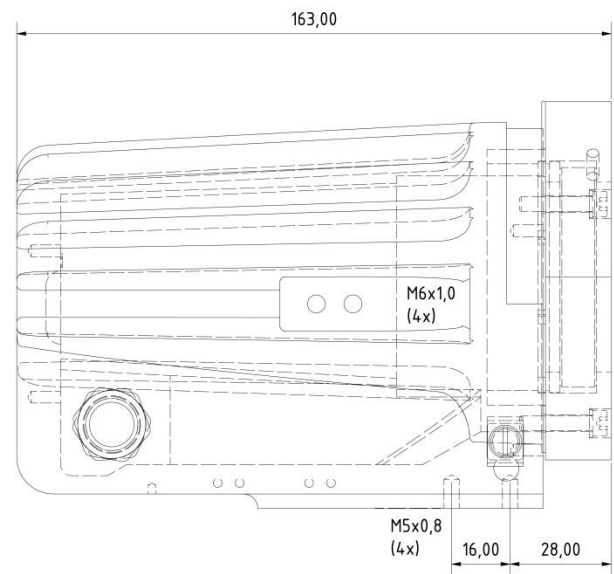


T03-AL-XX (K1)

Front view

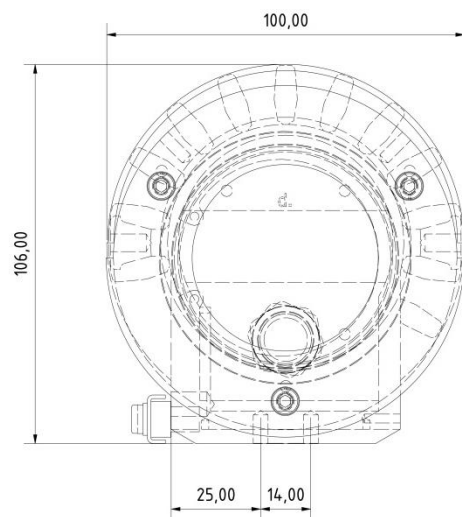


Side view from left

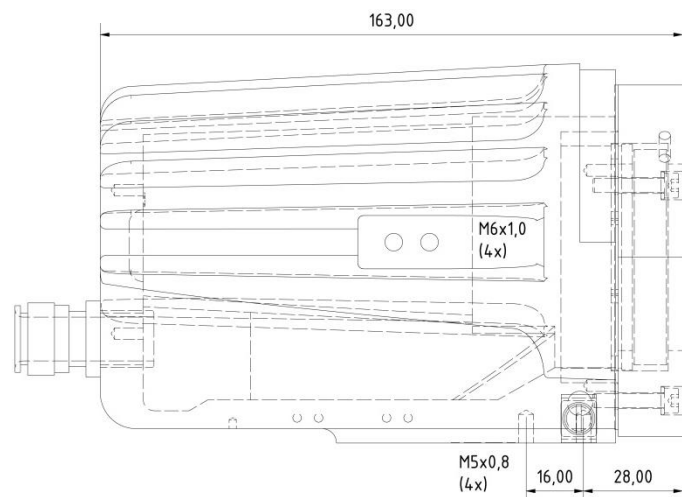


T03-AL-XX (K2)

Front view



Side view from left





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